



Organizational Slack in the Global Information Technology Industry

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ABSTRACT

Non-deployed resources (like cash and marketable securities), or in some cases, deployed but easily recoverable, resources (like sales and administration expenses) are termed slack resources and become the basis for managerial discretion. This study examines the relationship between organizational slack and firm performance in the global information technology industry. Results from a structural equation model show that organizational slack has a negative and significant impact on growth and profit performance which supports the predictions of agency theory. Market performance, however, has no impact on organizational slack.

INTRODUCTION

All viable businesses go through periods of time when profits are rising. Broadly speaking, increases in profits can be used to invest in resources to grow the business, paid out as dividends to the shareholders, or retained as financial capital available to the firm but not yet deployed. These non-deployed resources (like cash and marketable securities), or in some cases, deployed but easily recoverable, resources (like sales and administration expenses) are termed slack resources and become the basis for managerial discretion. On one hand, slack resources are desirable because they provide a financial cushion to buffer the company against unexpected changes in the business environment. In accumulating slack, firms forego short term business opportunities in favor of gaining competitive advantage in the future. This view of how organizational slack impacts firm business performance is grounded in organizational theory which argues that a firm is similar to a living entity and needs slack resources to grow and prosper in the face of dynamic and uncertain environments (March and Simon, 1958). On the other hand, these slack resources represent a source of inefficiency because these resources are not being put to their most productive use. Agency theory argues that slack resources create inefficiencies, reduce risk taking and lower overall business performance (Jensen and Meckling, 1976). Behavioral accounting researchers find support for agency theory in that managers often build slack into their budgets (Dunk and Nouri, 1998).

This study examines the relationship between organizational slack and firm performance in the global information technology industry (defined broadly as large firms engaged in computer hardware, software and communications equipment with an international focus). An industry study is important because industry structure along with sustainable competitive advantage, are the two fundamental factors that determine business profitability (Porter, 1980, 2001). The global information technology industry provides an interesting backdrop from which to study the impact of slack resources on firm performance because this is an industry that is often perceived as being short term focused, has gone through a recent period of enormous turmoil and the dominant companies in the industry have varying amounts of slack resources. Microsoft, for example, had over \$49 billion dollars in cash and short term money market investments at the end of 2003 which was up from \$38 billion the year before. By comparison, Cisco Systems had slightly over \$8 billion dollars in cash and short term money market investments at the end of 2003 which was down from over \$12 billion the year before.

THEORY AND HYPOTHESES

Greenley and Oktengil (1998), page 378, present a nice intuitive definition of slack.

Slack is that cushion of actual or potential resources that allows an organization to successfully adapt to change, by providing the means for adapting strategies to the external environment.

The theory behind organizational slack is grounded in two competing schools of thought. Organizational theory posits the firm as a living organism interested in survival (Cyert and March, 1963, Thompson, 1967). In organizational theory slack is necessary for the long term survival of the firm (March and Simon, 1958). According to organizational theory slack performs four main functions (Tan and Peng, 2003). First, slack provides an inducement to organizational members (payments in excess of organizational costs). Second, slack provides resources for conflict resolution (every problem has a solution). Third, slack provides a buffer to protect the organization from a fast changing and volatile business environment. Fourth, slack allows the firm necessary resources to experience changes in strategy. Organizational theory recognizes that holding valuable resources idle does constitute a cost to a business but advocates the idea the benefits from slack outweigh the costs. Organizational theory suggests the following two hypotheses.

- **Hypothesis 1a:** The relationship between organizational slack and growth performance is positive.
- **Hypothesis 2a:** The relationship between organizational slack and profit performance is positive.

In comparison, agency theory advances the idea that organizational slack is wasteful. In agency theory, the firm is a collection of contracts between principles and agents (Fama, 1980). Slack may be good for agents to pursue their own selfish goals, but slack is not good for the organization as a whole (Jensen and Meckling, 1976). Under agency theory, slack leads to inefficiencies, restricts risk taking and inhibits growth. Agency theory suggests the following two hypotheses.

- **Hypothesis 1b:** The relationship between organizational slack and growth performance is negative.
- **Hypothesis 2b:** The relationship between organizational slack and profit performance is negative.

As is often the case in the strategic management literature, growth and profitability are often used either in isolation or in combination with one and other to measure firm performance (Varaiya, Kerin, and Weeks, 1987, Woo, Willard, and Dailenbach, 1992). More recently, Cho and Pucik (2005) have investigated the direct and indirect relationship between growth, profitability and shareholder value and found that both growth and profitability have mediating effects on market value. There results suggest the following hypotheses.

- **Hypothesis 3:** The relationship between growth performance and profit performance is positive.
- **Hypothesis 4:** The relationship between profit performance and market value is positive.

In addition to the relationships between slack and business performance, it is also useful to propose a feedback relationship between business performance and slack. In other words, where do the resources to create slack come from? Appealing to organizational theory, companies with strong business performance are more likely to have monies available to devote to organizational slack. Hence, the following hypothesis is put forward.

- **Hypothesis 5:** The relationship between market value and organizational slack is positive.

Figure 1 shows the hypothesized model of organizational slack, growth performance, profit performance, and market performance.

The empirical evidence on the relationship between slack and firm performance is mixed. Singh (1986) studies 64 large Canadian and U.S. companies and finds that a high level of absorbed and unabsorbed slack is related to good financial performance. Bromiley (1991) studies 288 U.S. companies and finds that available and potential slack increase business performance. Miller and Leiblein (1996) U.S. firms in four different sample periods and find that slack increases firm performance. Greenley and Oktengil (1998) study 134 U.K. firms and find a positive relationship between slack and firm performance for large firms but no relationship between slack and firm performance for small firms. In a sample of Chinese companies, Tan and Peng (2002) find that absorbed slack has little impact on firm performance while unabsorbed slack has a positive impact on firm performance.

DATA AND METHODS

The list of companies used in this study comes from the iShares S&P Global Information Technology Sector which consists of large capitalization information technology companies and trades on the AMEX under the ticker symbol, IXN. Firms like Apple Computer, Cisco Systems, Corning, Dell Computers, EMC, Hewlett Packard, IBM, Intel, Lucent, Microsoft, Nortel Networks, Qualcomm, Sun Microsystems, Xerox and Yahoo are included in the list. Firm specific data measured in millions of dollars for the years 2001 – 2003 come from COMPUSTAT. Three year averages and growth rates were used in constructing the variables discussed below in order to avoid spurious effects from taking just one year of data. In total, 75 firms were included in the analysis. Many of the included companies were American, but some were European and Asian.

Organizational slack was measured as a construct using the three year average value (2001 – 2003) of absorbed slack, unabsorbed slack and immediate slack (Cronbach's alpha = 0.64). Constructs are useful when several different indicators correlate highly with each other and each proxies the same underlying concept. Absorbed slack refers to excess costs in organizations that are not easy to redistribute (Sharfman et al., 1988). Absorbed slack was measured as the ratio of selling, general, and administrative expenses to sales (Greve, 2003). Unabsorbed slack refers to current underemployed resources that could be redistributed elsewhere. Unabsorbed slack was measured by the ratio of quick assets (cash and marketable securities) to liabilities (Greve, 2003). Immediate slack was measured by the ratio of working capital to sales (Finkelstein and Hambrick, 1990).

Initially, an additional organizational slack variable was included using the three year average value of absorbed slack squared, unabsorbed slack squared and immediate slack squared (Cronbach's alpha = 0.45). This variable was meant to capture the curvilinear properties of slack that some author's find (Tan and Peng, 2003) but later dropped from the analysis due to the low alpha value and poor construct validity.

Growth performance was measured as a construct using annualized continuously compounded growth rates over the years 2001 - 2003 on

Table 1. Correlations and descriptive statistics

Correlations (N=75)										
	1	2	3	4	5	6	7	8	9	10
1 Absorbed slack	1.00									
2 Unabsorbed slack	0.56**	1.00								
3 Immediate slack	0.82**	0.81**	1.00							
4 ROA	-0.34**	-0.15	-0.31**	1.00						
5 ROE	-0.29*	-0.09	-0.26*	0.88**	1.00					
6 ROI	-0.28*	-0.06	-0.23*	0.88**	0.75**	1.00				
7 Market to Book	-0.05	0.01	-0.04	0.26*	0.20	0.34**	1.00			
8 Sales	-0.12	-0.13	-0.22	0.53**	0.50**	0.56**	0.31**	1.00		
9 Assets	-0.21	-0.07	-0.19	0.73**	0.66**	0.73**	0.29*	0.69**	1.00	
10 Market value	0.05	-0.17	-0.05	0.34**	0.29*	0.38**	0.15	0.52**	0.54**	1.00
mean	0.42	2.66	1.43	-0.07	-0.11	-0.11	3.90	-2.10	1.29	21726
St dev	0.29	2.55	1.07	0.36	0.52	0.52	2.40	15.08	13.41	47098
max	2.31	17.29	8.74	0.21	0.46	0.34	13.83	27.26	30.45	320755
min	0.05	0.65	0.41	-2.64	-3.11	-3.11	-0.30	-57.79	-58.18	4

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

sales, assets and market value (market capitalization) (Cronbach's alpha = 0.80) (Cho and Pucik, 2005).

Following Cho and Pucik (2005), profit performance was measured as a construct using the three year average (2001 – 2003) value of return on assets (ROA), return on invested capital (ROI) and return on equity (ROE) (Cronbach's alpha = 0.92). ROA and ROI have both been previously used to study profitability in the telecommunications industry (Bae and Gargiulo, 2004).

Market performance was measured using the three year average value (2001 – 2003) of market to book ratio. The market to book ratio tends to be widely excepted and easily accessible measure to compute (Cho and Pucik, 2005). There are, of course, many other measures of market performance including Tobin's Q and economic value added, but these measures were not tried in this study.

A correlation matrix of the variables used in this study shows that a number of the variables within each construct are significantly correlated (Table 1). Also notice the wide variation (as measured by the mean, standard deviation, maximum and minimum) in slack measures illustrating the differences in slack resources even for firms in the same industry.

A structural equation model (SEM) was used to test the hypotheses. An SEM is a particularly useful modeling technique to use with latent variables because SEM accounts for correlation among the latent variables and tests for convergent and discriminant validity. An SEM allows for measurement errors, residual errors, as well as reciprocal causality and simultaneity (Segars, 1997, Byrne, 2001). All estimation was performed using maximum likelihood estimation in the software package AMOS 5. A two step approach to structural equation modeling was used where in the first step the measurement model was estimated and tested and in the second step the structural equation was estimated and hypotheses tested (Anderson and Gerbing, 1988).

RESULTS

The estimated measurement model was evaluated for convergent validity and discriminant validity. Each of the factor loadings was highly significant (Table 2). All of the standardized factor loadings were greater than 0.57 and two thirds of them were larger than 0.80. Composite factor reliability can be evaluated using internal consistency measures and average variance extracted (Fornell and Larcker 1981, Segars, 1997). Internal consistency values greater than 0.70 and average variance extracted larger than 0.50 are considered to be adequate to establish individual indicators and constructs. The lower panel of Table 2 shows that composite factor reliability is established for each construct.

Discriminant validity is verified if a construct shares more variance with its own measures than with other constructs. For discriminant validity to be established, the correlation between two constructs must be less than the square root of the average variance extracted. Each construct demonstrated discriminant validity because the diagonal of the correlation matrix (right side of second panel in Table 2) has elements that are

Table 2. Results of the measurement model

Measurement paths	Factor loadings
Slack	
Absorbed slack	0.917***
Unabsorbed slack	0.604***
Immediate slack	0.896***
Growth	
Sales	0.723***
Assets	0.962***
Market value	0.569***
Profits	
ROA	0.995***
ROE	0.882***
ROI	0.888***
Standardized loadings shown	
*** p < 0.001	

Latent variables	Internal consistency	Average variance extracted	Correlations between latent variables		
			Slack	Growth	Profits
Slack	0.855	0.670	0.818		
Growth	0.805	0.591	-0.234	0.769	
Profits	0.945	0.852	-0.372	0.756	0.923

Diagonal elements in the correlation matrix are square roots of average variance extracted.

greater than the off diagonal elements in the corresponding rows and columns.

Having established the measurement model satisfies both convergent and discriminant validity, the next step was to estimate and test the structural equation model. Model fit was assessed using CMIN (minimum discrepancy) to test the equality between the unrestricted sample covariance matrix and the restricted covariance matrix. Higher probability values are indicative of a closer fit between the hypothesized model and the perfect fit model. Because CMIN is very sensitive to sample size, it was assessed in combination with other statistics (Byrne, 2001). The Incremental Fit Index (IFI), Tucker-Lewis Index (TLI) and Comparative Fit Index (CFI) range between 0 and 1, with values greater than 0.90 indicating an acceptable fitting model (Bentler and Bonett, 1980; Hu and Bentler, 1998). Smaller values of the root mean squared error of approximation (RMSEA) indicate a better fit to the data (Byrne, 2001). More specifically, RMSEA values below 0.08 indicate a reasonable fit, whereas values below 0.05 suggest a good data fit. The results reported in Table 3 show that the estimated SEM fits well. In addition the stability index for the recursive model was 0.061 which is less than the 1.0 for an admissible solution. As a further check on model misspecification, the standardized residuals were examined. None of the standardized residuals were larger than 1.96 in absolute value whereby indicating no evidence of model misspecification.

Turning now to the results from the structural equation model hypotheses tests (Table 4), the relationship between slack and growth performance is negative and significant which supports Hypothesis 1b. It is also the case that the relationship between slack and profit performance is

Table 4. Results of structural equation model hypotheses tests

Structural paths	Hypothesis	Structural estimates	p value	Outcome
Slack to growth	H1a,b	-0.245	0.064	H1a rejected, H1b supported
Slack to profits	H2a,b	-0.212	0.016	H2a rejected, H2b supported
Growth to profits	H3	0.713	<0.001	H3 supported
Profits to market	H4	0.293	0.019	H4 supported
Market to slack	H5	0.059	0.677	H5 rejected

Table 3. Structural equation model goodness of fit statistics

CMIN(df)	CMIN (p)	IFI	TLI	CFI	RMSEA (low, high) ^a
43.03(30)	0.06	0.98	0.96	0.98	0.08 (0.00, 0.12)

^a For RMSEA, low and high denote the lower and upper bound for a 90% confidence interval.

negative and significant which supports Hypothesis 2b. Hypotheses 1b and 2b are each supported at a high level of significance which points to the usefulness of agency theory in understanding the relationship between organizational slack and firm performance. Hypotheses 1a and 2a which pertain to the organizational theory of slack are rejected. As expected, growth performance is positively related to profit performance and Hypothesis 3 is supported at a high level of significance. The relationship between profit performance and market performance is positive and significant, confirming support of Hypothesis 4. No support was found for Hypothesis 5 which posits a positive relationship between market performance and slack. A possible explanation for this is that companies with strong business performance are more likely to be operating efficiently and thus less likely to have funds to devote to accumulating slack resources.

DISCUSSION AND CONCLUSIONS

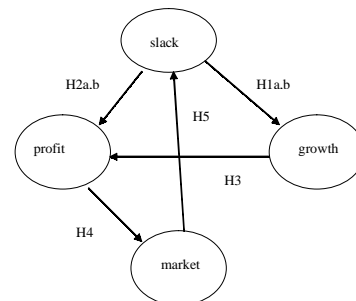
The major contribution of this paper is to propose a theoretical model of the firm linking organizational slack with overall business performance (incorporating growth, profits and stock market valuation) and estimating such a model using data from the global information technology industry. Results from a structural equation model reveal that organizational slack has a negative and significant impact on growth and profit performance which supports the predictions from agency theory. Market performance, however, has no impact on organizational slack.

One important managerial implication is that global information technology companies should avoid accumulating slack because slack correlates negatively with both growth performance and profit performance. Investors looking for investment opportunities or managers looking to form joint ventures should be wary of companies with too much slack as it dampens business performance.

There is still concern by some technology and innovation management observers that too much money is being spent on IT related projects (Gianforte, 2005). Reducing slack resources would pressure IT suppliers and IT customers to become more effective and efficient in their use of IT. Increased efficiency and the resulting positive impact on productivity could only lead to increased business performance.

This paper does have a number of limitations that need to be pointed out. One important limitation is that the data set consists of 75 firms which is a relatively small number of observations for the structural equation modeling technique which is a large sample methodology. Conceptually, the global information technology industry tends to be dominated by a small number of very large companies. Empirically, every attempt was made to check for model misspecification and none

Figure 1. The hypothesized model of organizational slack, growth performance, profit performance, and market performance



was found. Another important limitation is that the results in this paper were derived from a sample of companies in one industry and as a result may not generalize to other industries. Another consideration is that the time period under study represents a very volatile period for the information technology sector. On March 10, 2000 NASDAQ reached an all time high of 5048.6 but just a few years later on October 9, 2002 was trading at a five year low of 1111.4 (data from <http://finance.yahoo.com/>). A further limitation is that the slack construct in this paper combines absorbed, unabsorbed and immediate slack together and thus possibly masking any differences these individual measures might have on business performance.

Never-the-less, even with these limitations, the results of this paper should help to stimulate interest in the important topic of organization slack in the global information technology industry and be of interest to managers, investors and policy makers.

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